

Golf and Nonpotable Water in the Coachella Valley

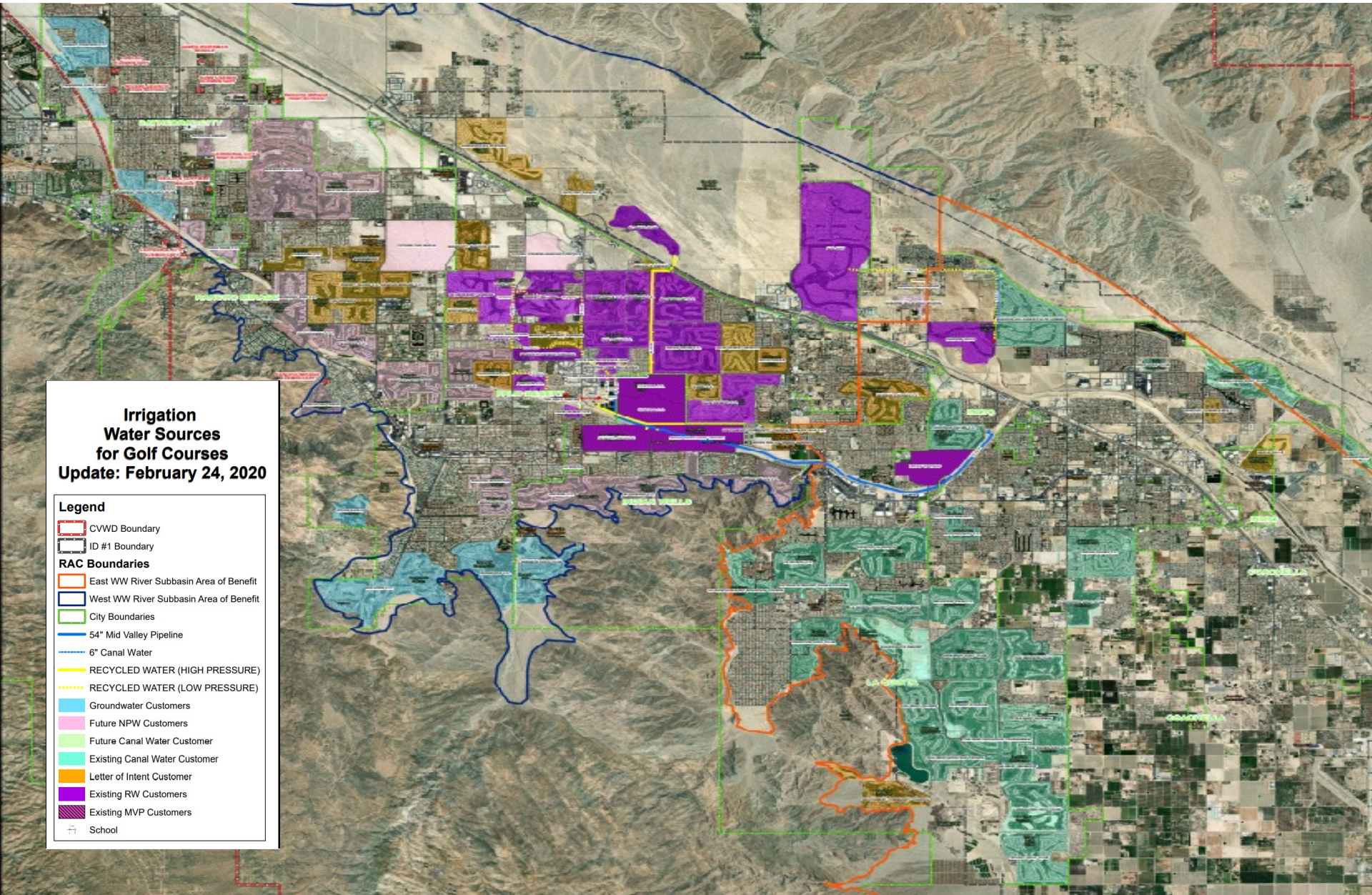


First golf course in the valley...

...was the O'Donnell in 1926, second was Indian Palms (used to be Cochran-Odlum) in 1947, third Thunderbird 1951...



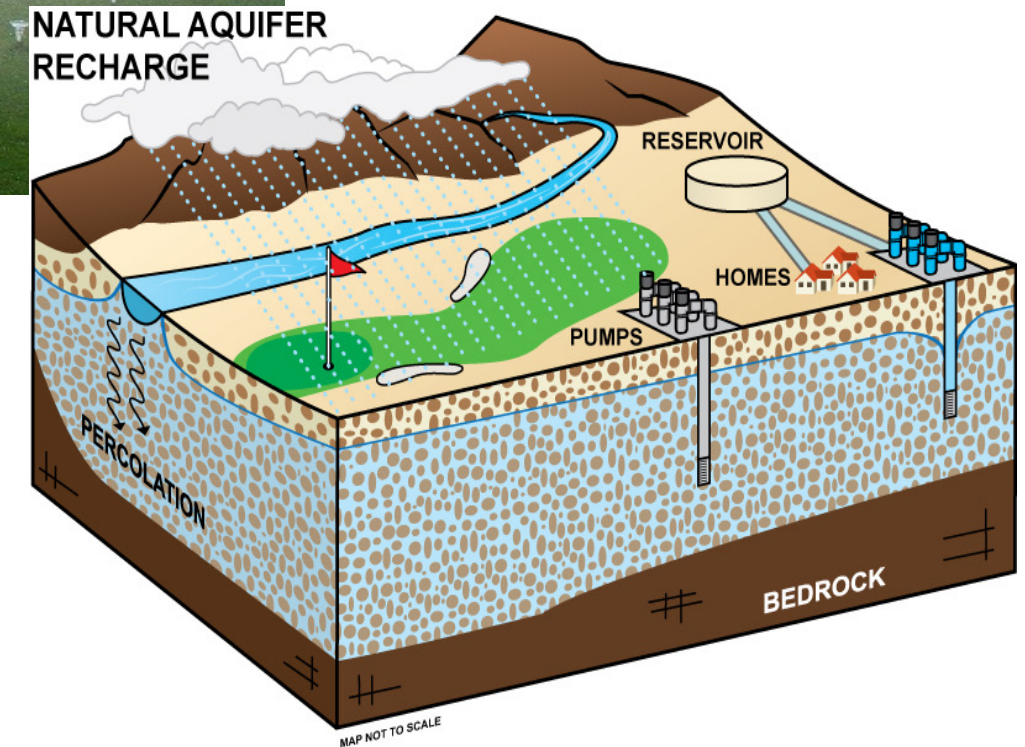
Now, there are 120 golf courses in the valley!



105 of the golf courses are within CVWD's boundaries.

Canal via Canal distribution system	30.5
Future Canal via Canal distribution system	3.0
Canal via Mid Valley Pipeline	6
Future Canal via Mid Valley Pipeline	17
Recycled water/canal	17.5
Future Recycled water/canal	21
Not planned for an Alternate Water Supply	10
Total Golf Courses:	105
Nonpotable Water Source:	54
Per Cent Using Nonpotable Water Source:	51%

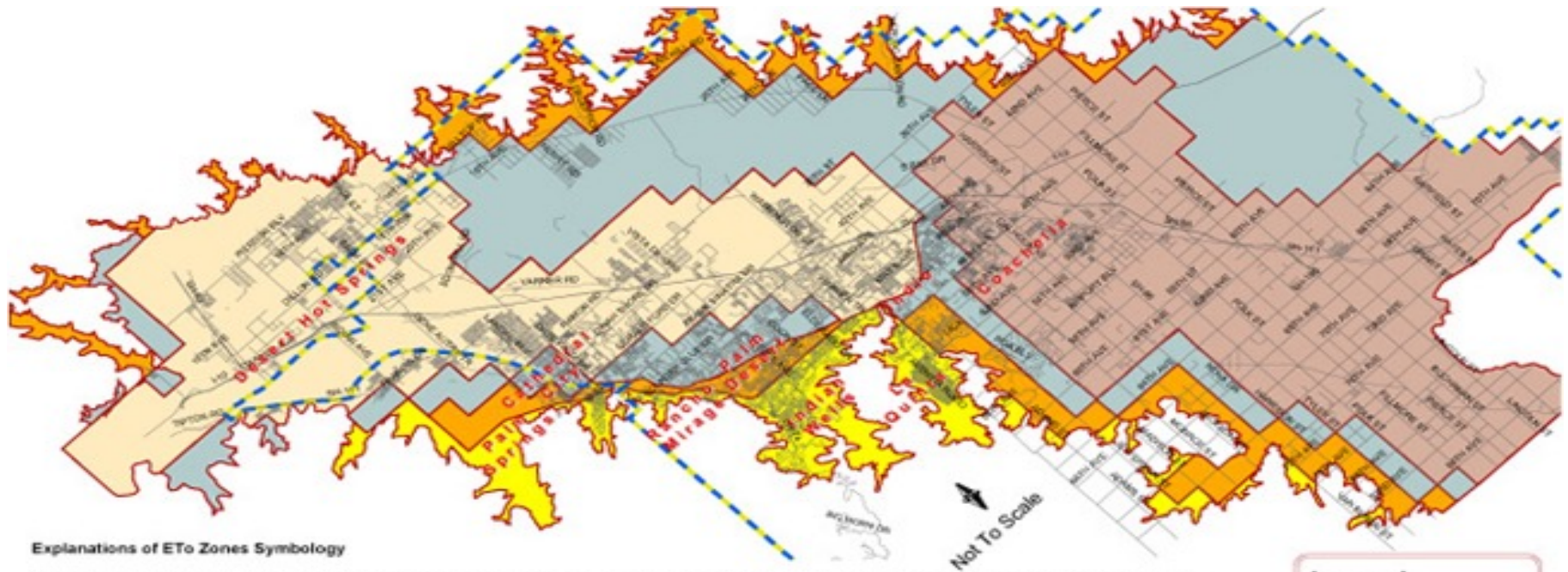
Sources of golf course irrigation water:



- Storm water
- Ground water
- Nonpotable Water

How much water is used by a golf course annually?

It depends primarily on the ETo zone, irrigated acreage and lake area. Anywhere from about 300 AF/Yr for our smaller courses in a protected area to about 1400 AF/Yr for our large courses in the windy areas. **Average of 998 AF/Yr.**



Explanations of ETo Zones Symbology

1. Zone #1: North-facing cove areas: Mountain shaded, sheltered from prevailing winds and higher elevations means lowest water consumption. Annual water consumption(ETo) = 57.01"
2. Zone #2: Transition zone area between the north-facing coves and the open desert or the south-facing cove areas of the north valley: The transition zones are somewhat sheltered from prevailing winds and with exposure to higher local humidity from irrigated landscapes means low water consumption. North valley coves are mountain shaded, sheltered from prevailing winds and higher elevations, but are south-facing and heat absorbing. Annual water consumption(ETo) = 66.82"
3. Zone #3: Upper valley open desert border zone, lower valley upper elevation zone or lower valley afternoon mountain shade zones with moderate prevailing winds and blowing sand. Annual water consumption(ETo) = 75.00"
4. Zone #4: Lower valley open desert agricultural zone with moderate prevailing winds and below sea level elevations. Annual water consumption(ETo) = 88.00"
5. Zone #5: Upper valley high wind and blowing sand zone. Annual water consumption = 93.90"

Legend

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Center Lines
- District Boundary

Average water use for a golf course

The average water use on a golf course is around 998 acft/yr.

To make it easy, we round up to say that “a typical golf course uses 1,000 acft per year”.

Golf Courses in the valley use up to 120,000 acft of water per year.



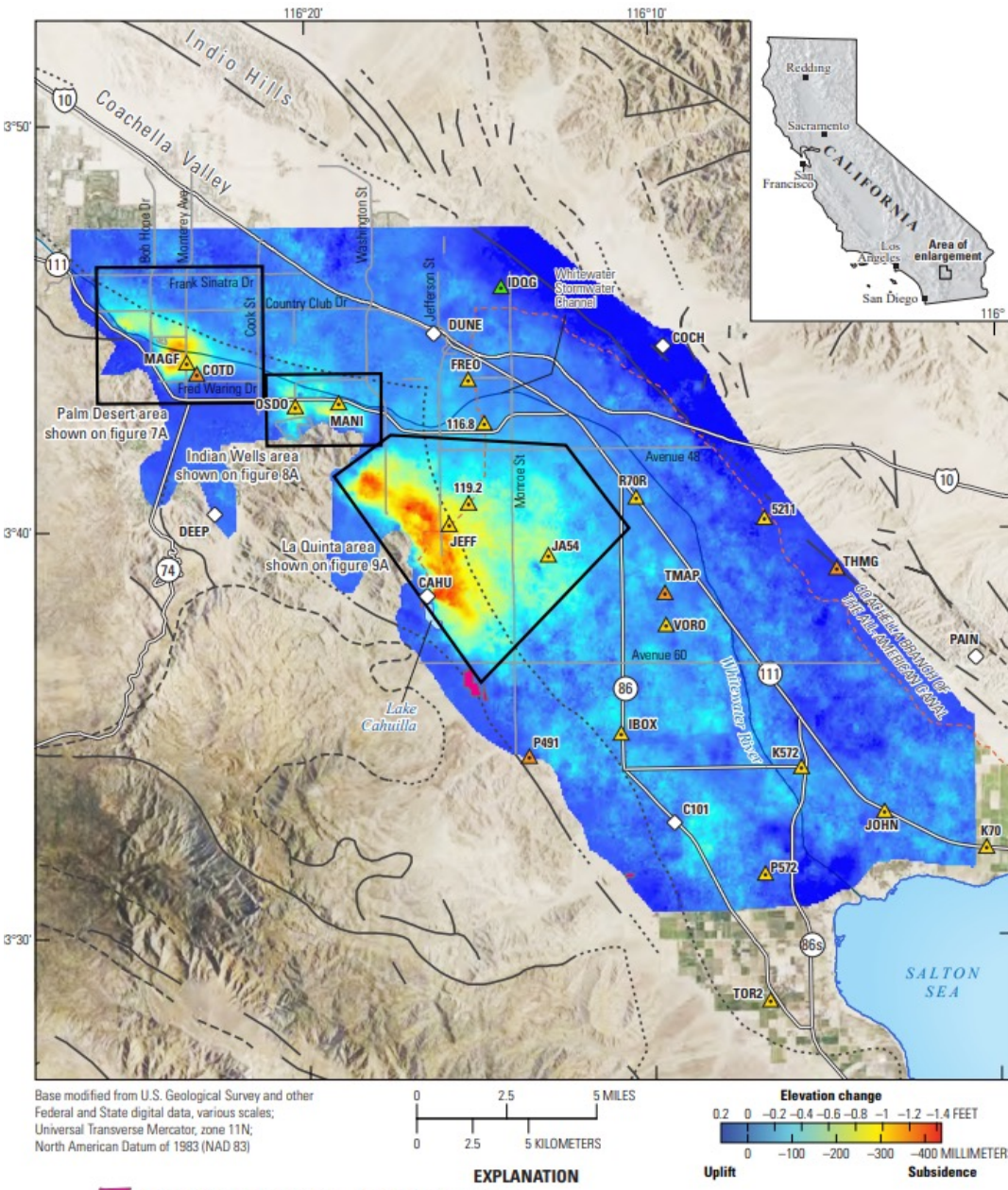
What's the big deal?

USGS report published in 2020.

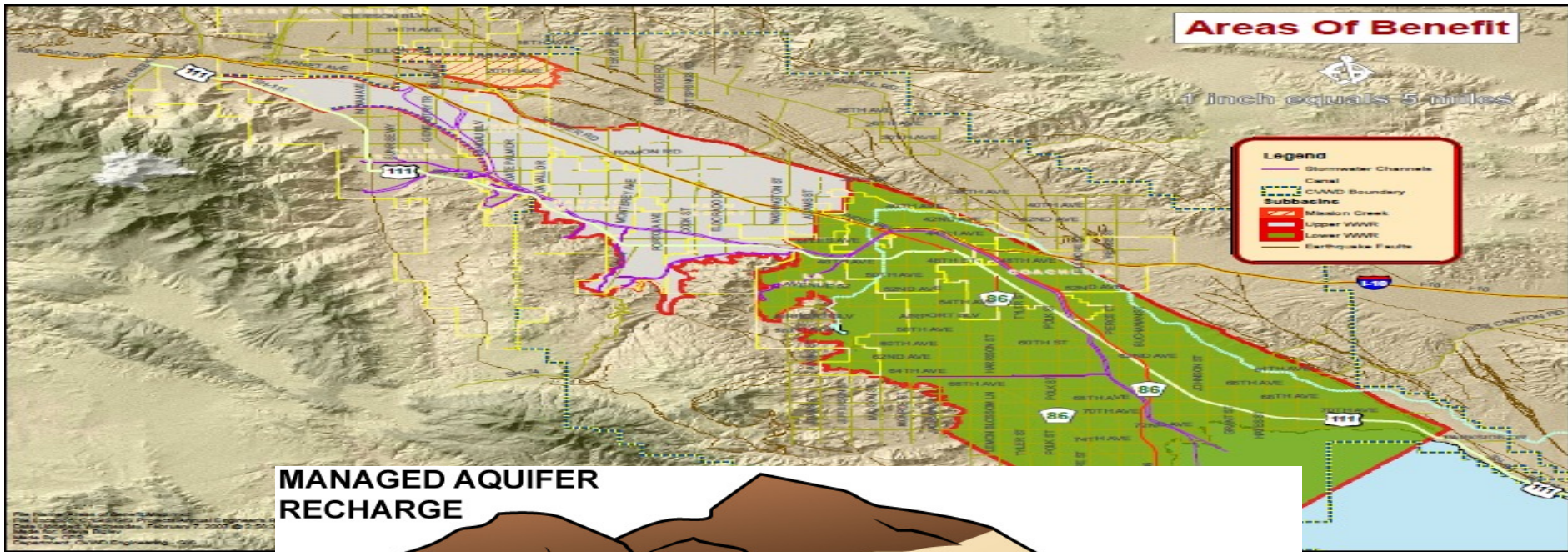
- CVWD and USGS study since 1996.
- Detection and measurement of land subsidence and uplift from 2010-2017.
- Yellow and red show areas of subsidence.
 - Up to 1.4ft



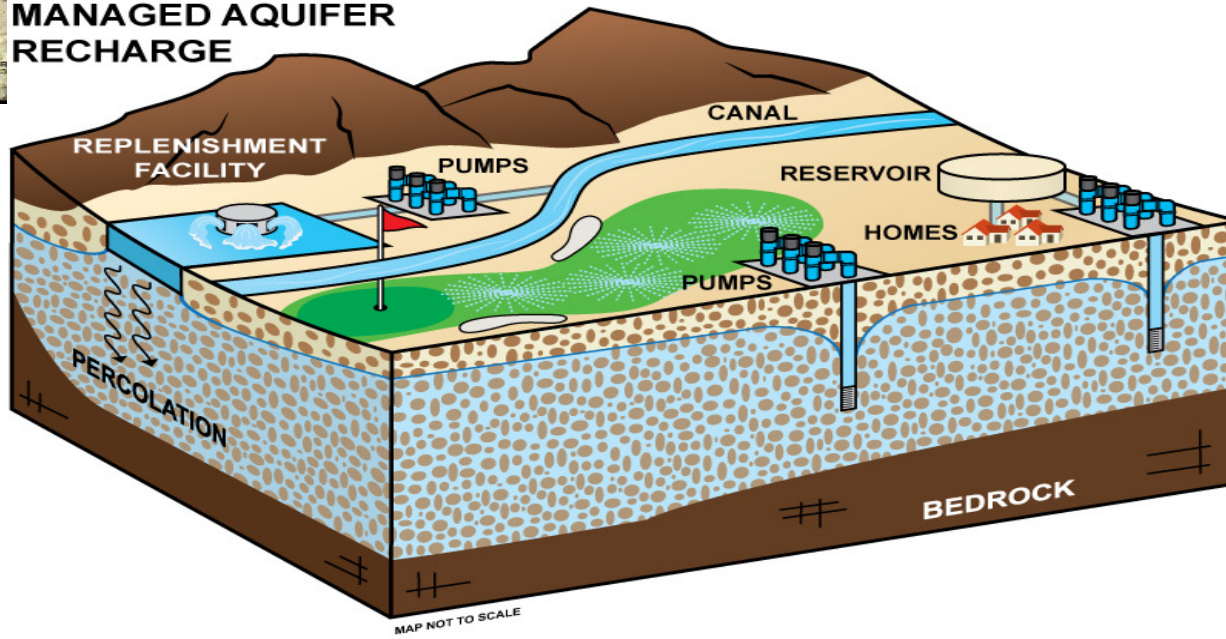
Overdraft and subsidence.



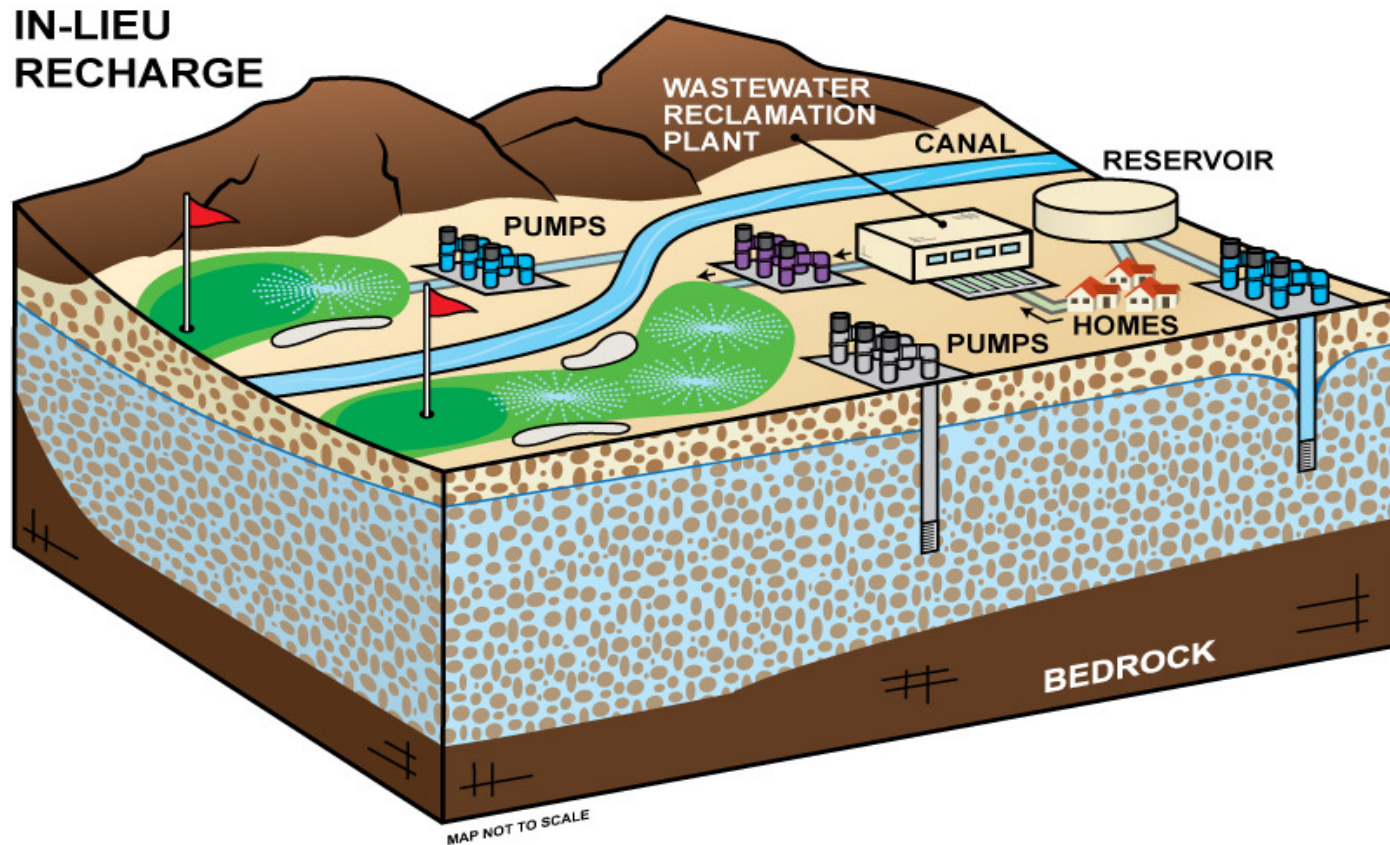
To minimize and eliminate further overdraft, the aquifer has been replenished with imported water.



MANAGED AQUIFER RECHARGE



In the mid-valley, mostly West, there are 38 golf courses available for **in-lieu recharge** opportunities.



In-lieu of delivering imported water to percolation ponds to replenish the aquifer, a nonpotable water source is delivered to golf courses for irrigation, leaving groundwater in the ground.

2022 Indio Sub-basin Water Management Plan Update



Volume 1: Alternative Plan
Adopted | December 2021

<http://www.indiosubbasinsgma.org/>

Prepared for: Indio Subbasin Groundwater Sustainability Agencies



Per the ISWMP...

In order to maintain water reliability and resilience, the following priorities are used when selecting Projects and Management Actions:

- Fully use available Colorado River water supplies.
- Continue developing recycled water as a reliable local water supply.
- Implement source substitution and replenishment for resilience in response to changing conditions and for maintaining long-term groundwater supply reliability.
- Increase water-use efficiency across all sectors.

ISWMP objectives for golf courses:

- Conservation
- Utilize nonpotable water sources for golf courses.





Golf and Water Task Force

Mission Statement

To ensure a sustainable water supply for future generations, to meet if not exceed the goals of the Coachella Valley Water Management Plan, **to pursue all feasible water conservation measures, to promote and expedite the use of nonpotable water,** and to educate Valley residents regarding the importance of pursuing these goals for the environmental and economic quality of life in the Coachella Valley.

Nonpotable Water for In-Lieu Recharge

Types of nonpotable water source for golf courses:

1. Canal Water (Colorado River Water)

- Mid-Valley Pipeline
- Coachella Branch of All American Canal
- Canal water distribution system.



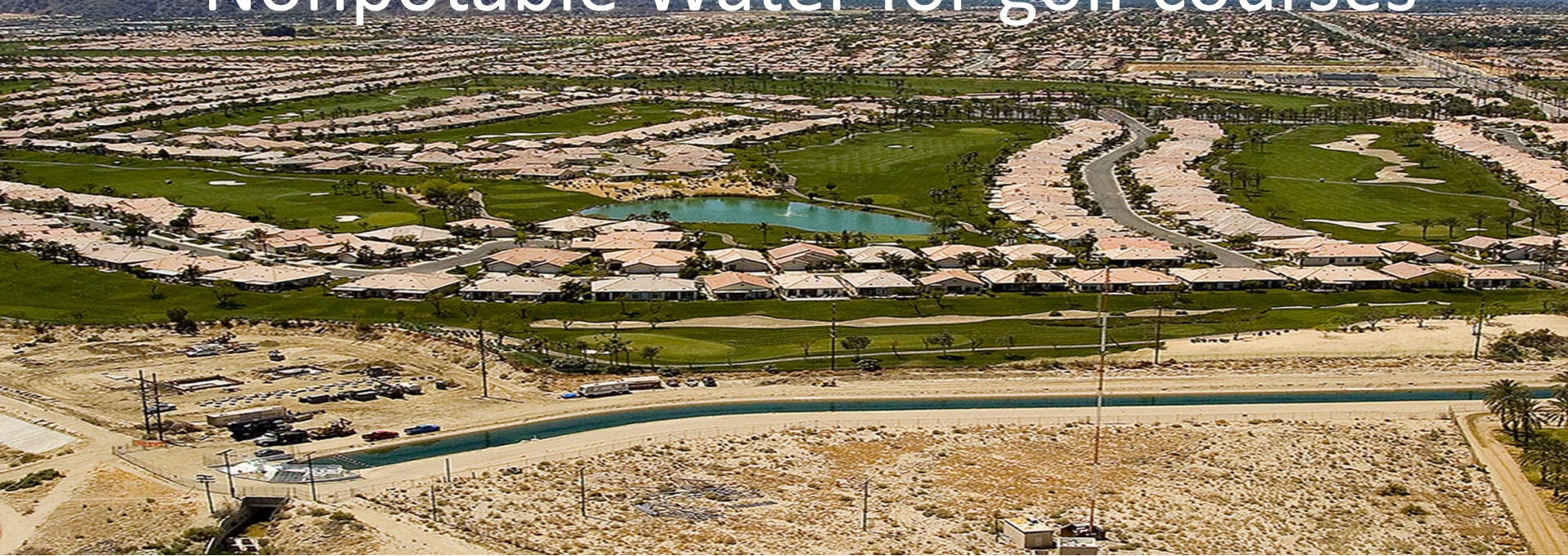
2. Recycled Water

- Water Reclamation Plant (WRP7 or WRP10)
- Tertiary Disinfected Recycled Water

✓ Nonpotable Water for nonpotable purposes.

- ✓ Nonpotable customers irrigate with a water source that is not deemed safe for drinking.
- ✓ Primary water source is no longer groundwater, our potable water source.

Nonpotable Water for golf courses



East Valley Canal water connections:

In 2022, 21,082AF, 74% of their total irrigation demand.

- Goal = up to 33,500 AFY
- 3 more golf courses to connect

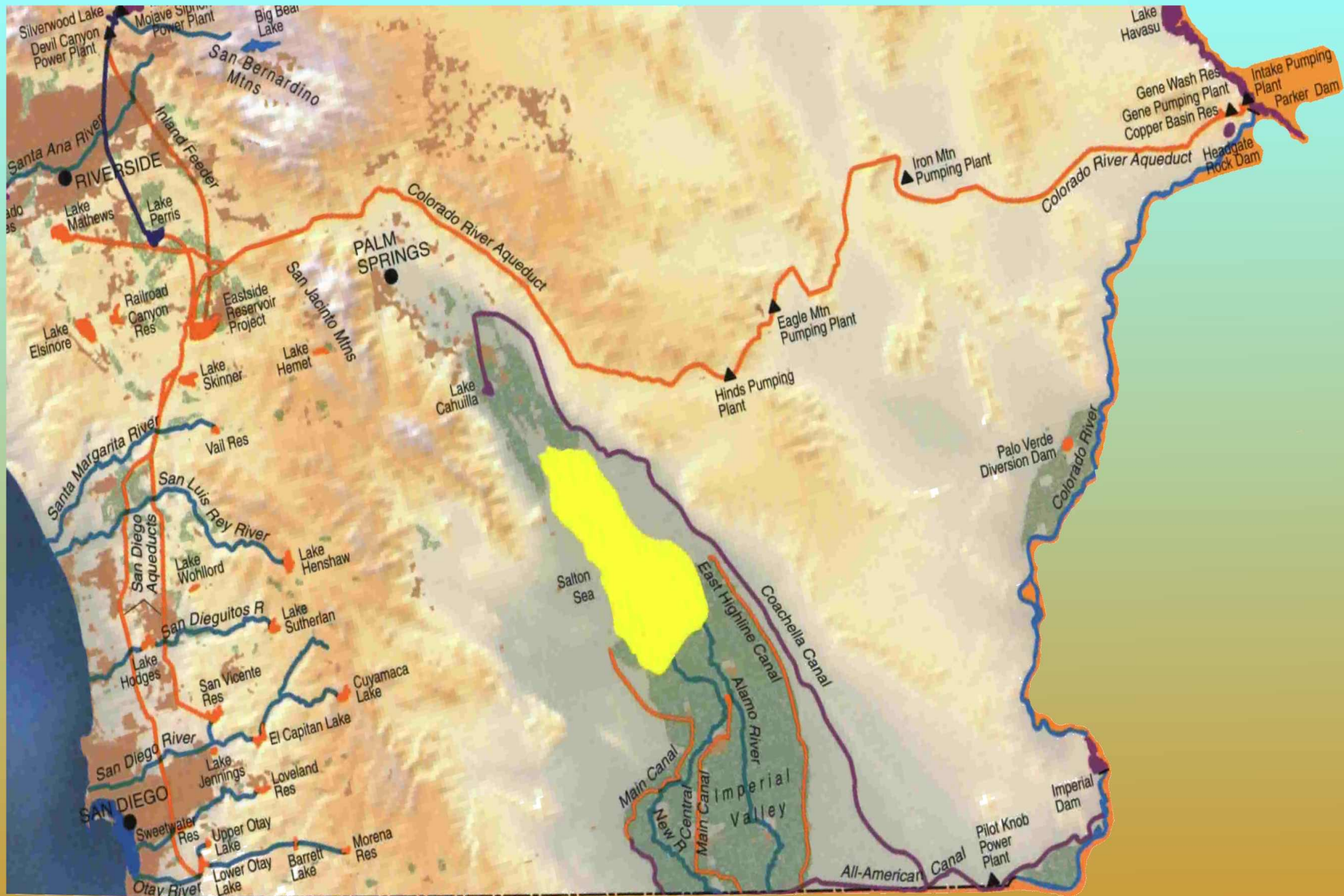
Mid Valley NPW connections:

In 2022, 24,533 AF, 93% of total irrigation demand.

- Goal = up to 61,500 AFY
- 38 more golf courses to connect

Goal =
80%

Source of Canal Water



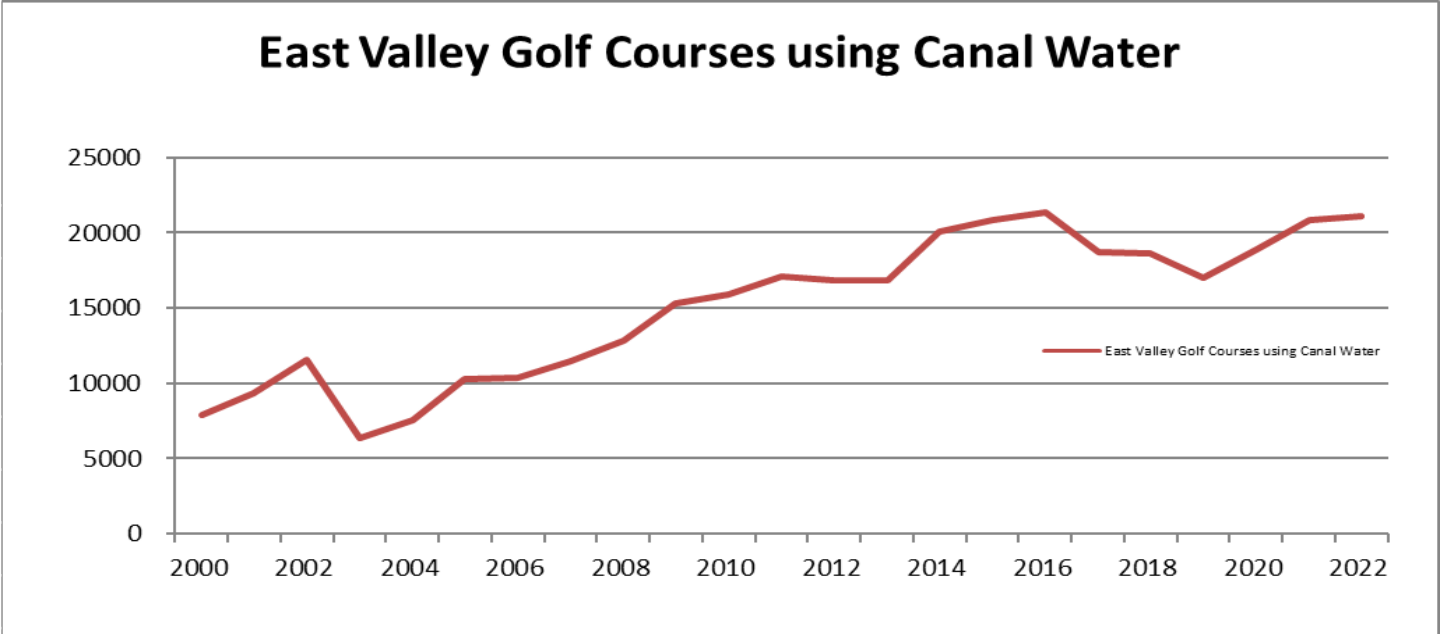
Conversion of golf courses to canal water



The 3 remaining conversions are expected to be completed by 2025.

East Valley Golf Courses using Canal Water

Year	East Valley Golf Courses using Canal Water
2000	7884.1
2001	9335.6
2002	11540.6
2003	6385.1
2004	7511.3
2005	10290.3
2006	10395.7
2007	11469.7
2008	12805.9
2009	15282.9
2010	15927.8
2011	17076.7
2012	16873.2
2013	16828.6
2014	20053.5
2015	20883.2
2016	21351.8
2017	18678
2018	18586
2019	17011
2020	18919.8
2021	20865
2022	21082.9



New Connections (see original connection dates tab):

1988	PGA West
1994	Indio Muni
1996	Plantation
1997	Traditions
1998	The Hills (Terra Lago)
1999	Heritage Palms
2000	The Palms
2001	Hideaway
2002	Trilogy, PGA West Weiskopf
2005	Silver Rock
2006	Outdoor Resort, PGA-Norman, Ranch La Quinta, Shadow Hills (front nine)
2007	Mountain View, Vineyards, Andalusia, Shadow Hills (back nine), Madison Club.
2010	Indian Palms
2014	Indian Palms (2nd connection)
2016	La Quinta CC, La Quinta Resorts Dunes
2022	La Quinta Resorts Mountain



Recycled Water

- Recycled water has been a water supply source in the Valley since 1965 at Palm Desert Country Club. CVWD acquired this WRP in 1968.
- CVWD has 2 wastewater treatment plants that provide recycled water for golf course and landscape irrigation.
- CVWD delivers disinfected tertiary recycled water for golf course and landscape irrigation.

What is Recycled Water?

Municipal wastewater collected from homes and businesses that receives a high level of treatment at a water reclamation plant. It is monitored 24/7, water quality samples are collected and tested to ensure permit regulation limitations are met, so that it can safely be beneficially reused. It is no longer considered wastewater.

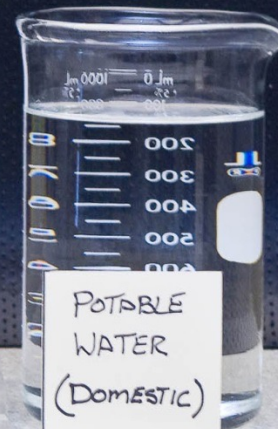




INFLUENT
EFFLUENT
(RAW
SEWAGE)

SECONDARY
EFFLUENT

TERTIARY
EFFLUENT
(RECLAIM)



POTABLE
WATER
(DOMESTIC)

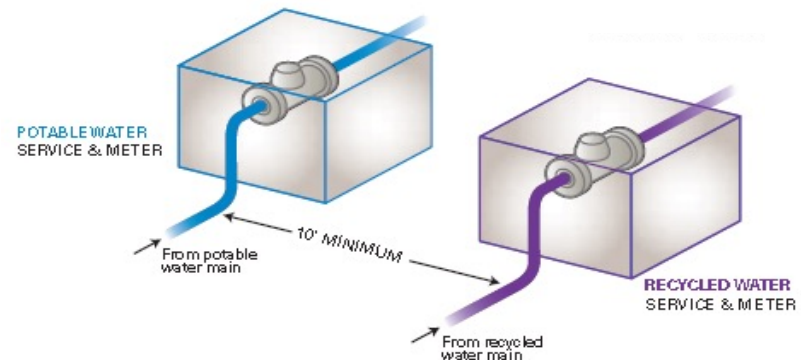


KROHNE

CAUTION

Rules and Regulations

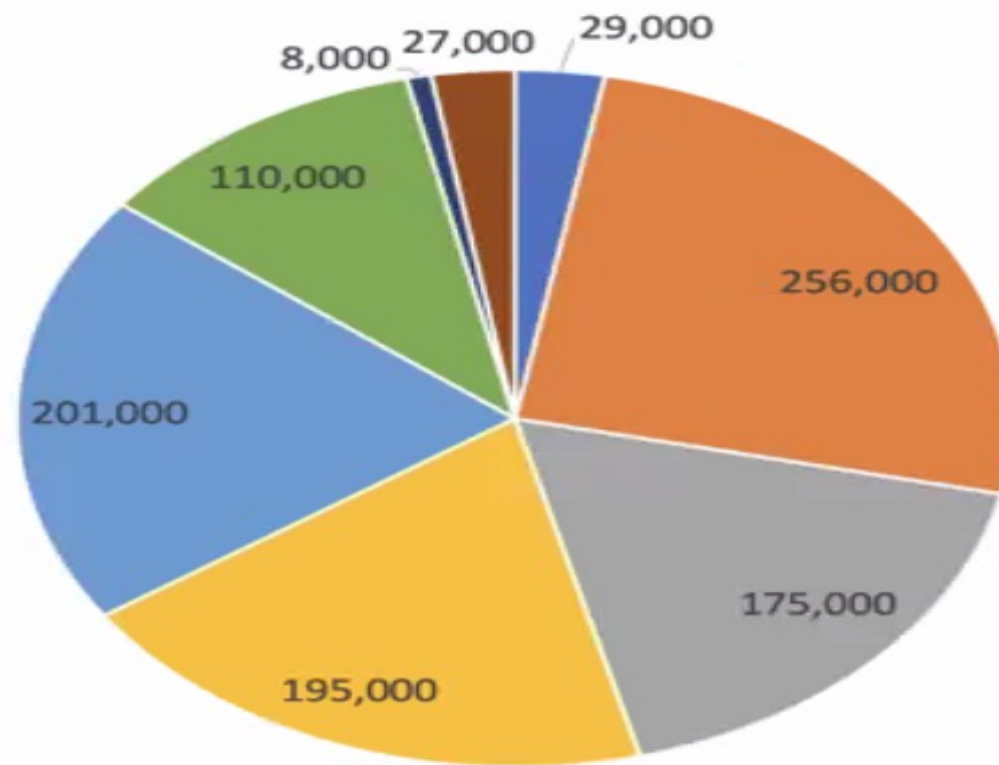
- Dos and Don'ts
- Training
- Permit
- Agreement
- Purple
- Signs
- Public notification
- Cross-connection Test
- Quarterly Survey
- Monitoring and Reporting



Allowed Uses of Recycled Water

Recycled Water Use	Treatment Level			
	Disinfected Tertiary Recycled Water	Disinfected Secondary 2.2 Recycled Water	Disinfected Secondary 2.3 Recycled Water	Undisinfected Secondary Recycled Water
Irrigation for:				
Food crops where recycled water contacts the edible portion of the crop, including all root crops	ALLOWED	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED
Parks and playgrounds				
School grounds				
Residential landscaping				
Unrestricted-access golf courses				
Any other irrigation uses not specifically prohibited by other provisions of the <i>California Code of Regulations</i>				
Food crops, surface-irrigated, above-ground edible portion, not contacted by recycled water		ALLOWED		
Cemetaries			ALLOWED	
Freeway landscaping				
Restricted-access golf courses				
Ornamental nursery stock and sod farms with unrestricted public access				
Pasture for milk animals for human consumption				
Non-edible vegetation with access central to recurrent use as a park				

2020 Recycled Water Use in California Hits 1 MAF Mark (Title 22 + Environmental Uses)



■ Natural Systems - 29,000 *

■ Potable Reuse - 175,000

■ Landscape/Golf Course Irrigation - 201,000

■ Geothermal Energy - 8,000

■ Instream Flows - 256,000 *

■ Ag Reuse - 195,000

■ Industrial Commercial - 110,000

■ Other - 27,000

*Not included as Title 22 use of recycled water. Water Board reports 728,000 AFY in Title 22 uses

Source: WaterReuse California

Recycled Water Use in Coachella Valley

A scenic view of a golf course in the Coachella Valley. In the foreground, a calm pond reflects the surrounding landscape. The middle ground is dominated by a lush green golf course with several sand traps and a dense line of tall palm trees. In the background, a range of rugged, brown mountains stretches across the horizon under a clear blue sky.

Golf Course and landscape irrigation:

- Golf Courses
- Home-Owner Associations (HOAs)
- High-School Athletic Fields
- Landscaped areas at CVWD's Palm Desert offices and WRPs.
- Agriculture (near future)

10 Reasons Why We Use Recycle Water in Coachella Valley



1. Department of Water Resources projects large statewide shortages.
2. Groundwater is our drinking water source (Potable/Domestic).
3. Groundwater could become adjudicated.
4. CVWD adopted and is implementing the ISWMP to eliminate overdraft and is our Groundwater Sustainability Plan, which identifies recycled water as a reliable local water supply for irrigation.
5. Irrigating with Recycled Water Saves Groundwater.

10 Reasons Why We Use Recycle Water in Coachella Valley



6. Future groundwater overdraft must be prevented.
7. Use potable water for potable purposes and non-potable for non-potable purposes.
8. Treatment technology can produce a safe recycled water for any given use.
9. RW for irrigation more economical than advanced treatment for potable reuse.
10. More economical than buying additional imported water rights.

Not enough recycled water



- Recycled water supply is not a sufficient water supply for all golf courses in the mid-valley area.
- Recycled water supply is limited in the summer and golf courses would supplement with groundwater.

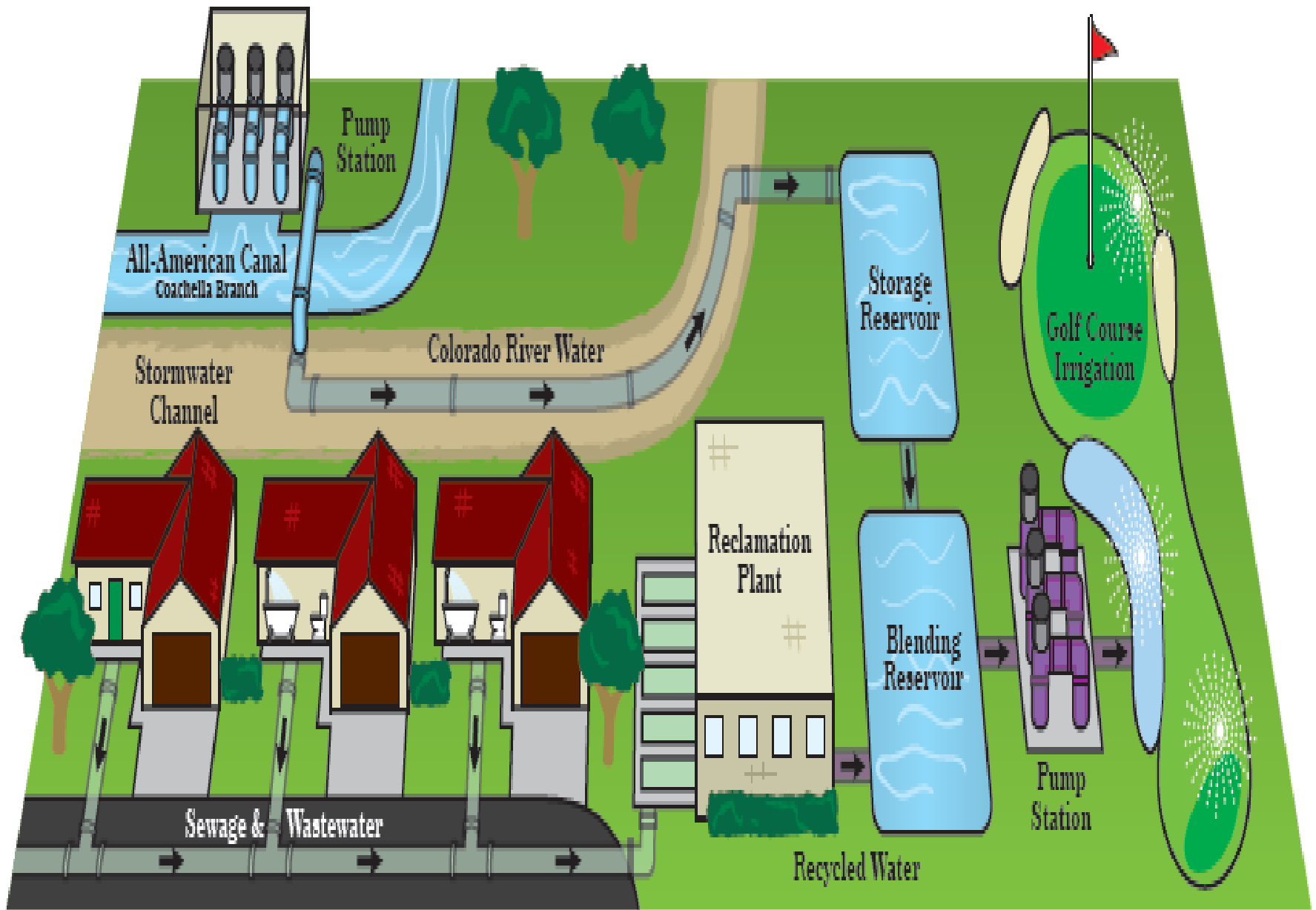
Mid-Valley Pipeline In-Lieu Project



- The MVP delivers canal water to WRP10. Completed in 2009. 7 mile, 54” pipeline of welded steel with cement mortar lining in the wash.
- Canal water supplements the recycled water supply and provided to golf courses in lieu of their pumping groundwater.

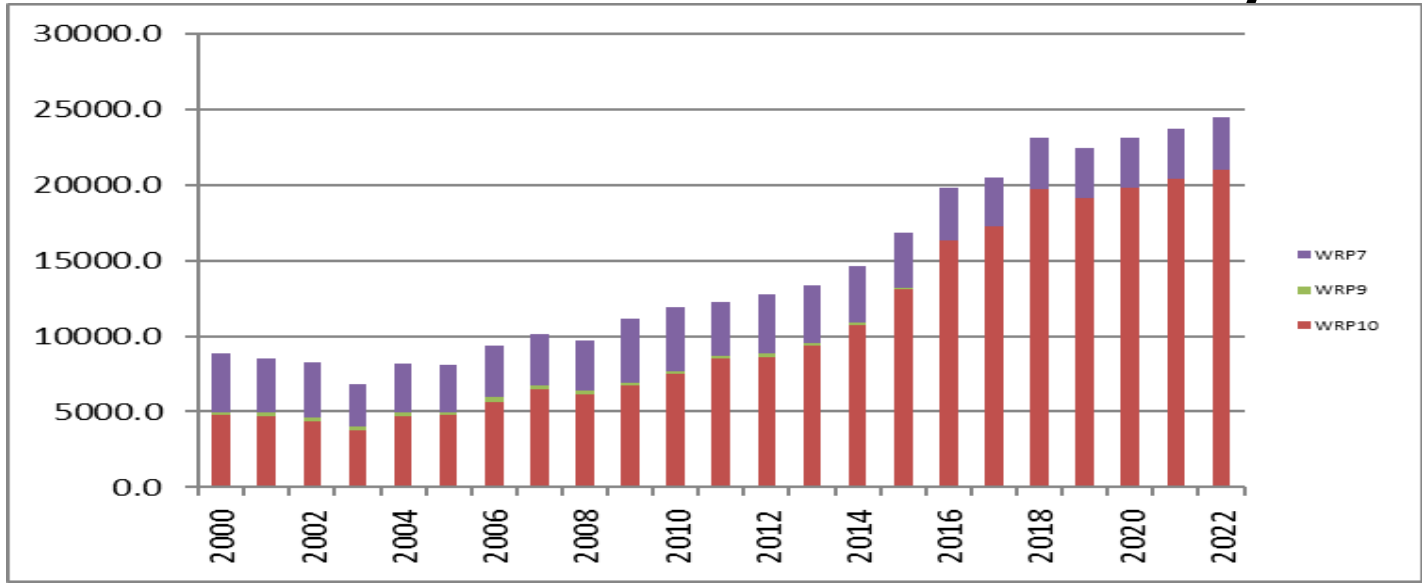
*In 2022, MVP provided 13,208 acft of canal water to golf courses in the mid-valley area.





Nonpotable Water use in Mid-Valley

Year	WRP NPW
2000	8831.9
2001	8565.2
2002	8299.4
2003	6844.2
2004	8208.9
2005	8109.3
2006	9342.7
2007	10127.0
2008	9750.2
2009	11047.4
2010	11874.9
2011	12281.2
2012	12756.4
2013	13384.7
2014	14601.7
2015	16876.0
2016	19796.1
2017	20515.6
2018	23138.8
2019	22461.8
2020	23109
2021	23744
2022	22951.4

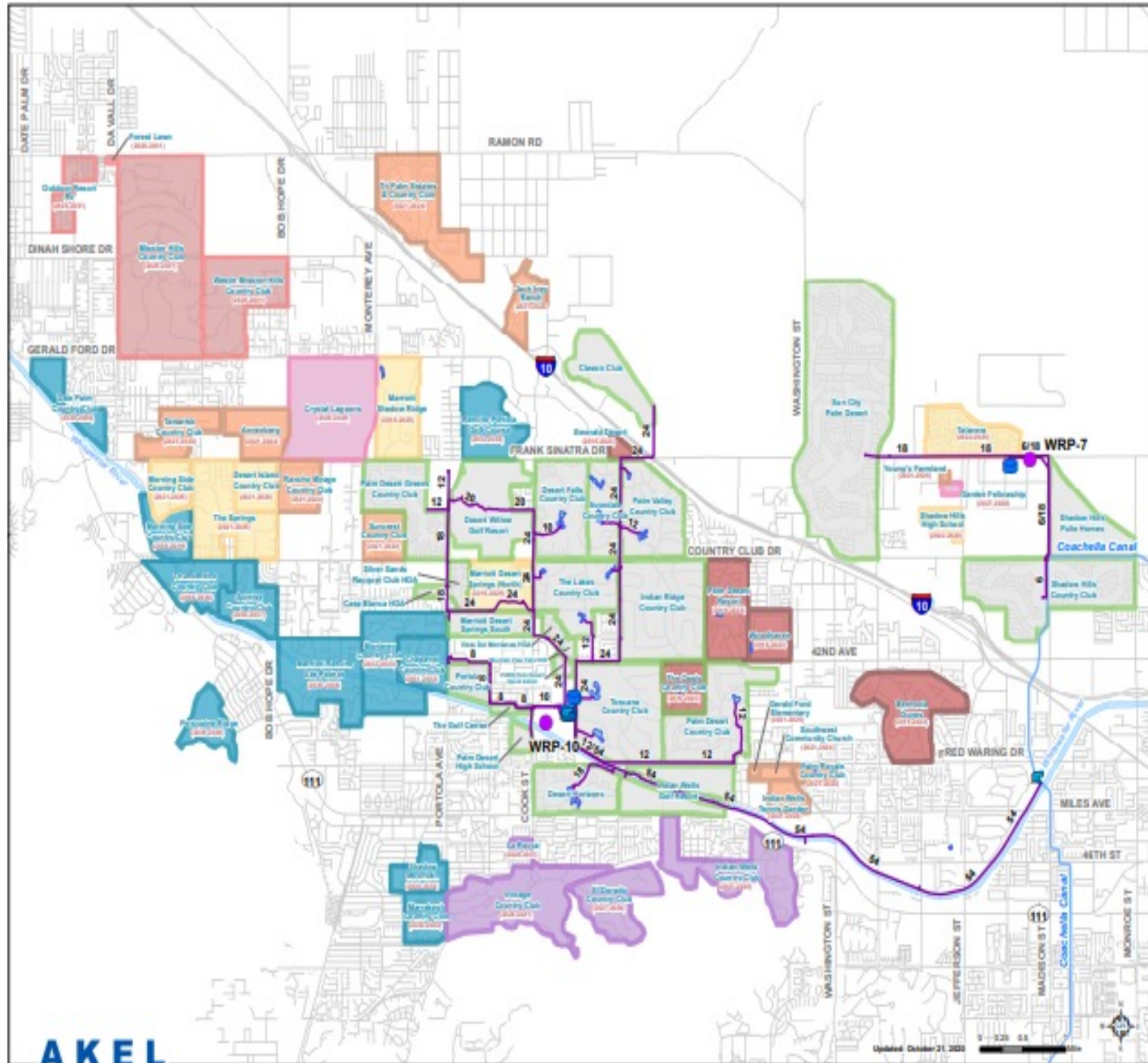


New Connections

1968	Palm Desert Country Club
1987	Santa Rosa, Palm Desert Greens, Portola CC
	Golf Center, Marriott Desert Springs, Vista Del Montanas, Silver Sands, Casa
1991	Blanca
1992	West Coast Turf
1993	Sunrise
1994	Indian Ridge CC
1996	Palm Desert High School
1997	Sun City Palm Desert, Desert Willow
1998	Mountain View Falls
2006	Toscana, Shadow Hills
2012	CVWD's PDA & PDO, Indian Wells Golf Resort
2014	Classic Club, Palm Desert CC (remaining)
2016	Desert Horizons, Lakes CC, Avondale
2017	Desert Falls, Palm Valley Country Club,
2018	Indian Springs

NPW Connections





- Legend**
- Implementation Schedule**
- 2018-2023 (Hypothetical)
 - 2018-2025 (Hypothetical)
 - 2021-2024 (Hypothetical)
 - 2025-2031 (Hypothetical)
 - 2026-2034 (Hypothetical)
 - 2027-2030 (Hypothetical)
 - 2030-Buildout (Hypothetical)

- Existing System**
- Water Reclamation Plant
 - Bladder Reservoirs
 - Pump Stations
 - Non-Potable Pipelines
 - Existing Users
 - Street Centerlines
 - Coachella Canal
 - Whitewater River

PRELIMINARY
FOR INTERNAL USE ONLY

Figure 1
NPW Customer Tentative Implementation Schedule
Non-Potable Water System
Master Plan Update
Coachella Valley Water District



When NPW build out is complete...

Canal via Canal distribution system	33.5
Canal via Mid Valley Pipeline	23
Recycled Water/canal	38.5
Not planned for an Alternate Water Supply	10

Total Golf Courses: 105

Nonpotable Water Source: 95

Per Cent Using Nonpotable Water Source: 90%

Golf courses using nonpotable water will allow potable water to be available for potable uses.

Estimated annual use of water is 1000 acft / year per golf course

$$1000 \text{ AFY} \times 120 \text{ golf courses} = 120,000 \text{ AFY}$$

30.5 golf courses in the east valley have access to canal water and 2 are focused on for future canal water use.

$$1000 \text{ AFY} \times (30.5 \text{ golf courses} + 3 \text{ golf courses}) = 33,500 \text{ AFY}$$

23.5 golf courses in the mid-valley use nonpotable water

$$1000 \text{ AFY} \times 23.5 \text{ golf courses} = 23,500 \text{ AFY}$$

6 golf courses in upper valley (DWA) use recycled water

$$1000 \text{ AFY} \times 6 \text{ golf courses} = 6,000 \text{ AFY}$$

The future Mid-Valley Pipeline Project, includes 38 golf courses in mid-valley to use recycled/canal water blend

$$1000 \text{ AFY} \times 38 \text{ golf courses} = 38,000 \text{ AFY}$$

$$120,000 \text{ AFY} - 33,500 \text{ AFY} - 23,500 \text{ AFY} - 6,000 \text{ AFY} - 38,000 \text{ AFY} = 19,000 \text{ AFY}$$



**Thank you
Olivia Bennett**

Nonpotable Water Operations Manager